Theme: Earth-Sun System
Program: Applied Sciences

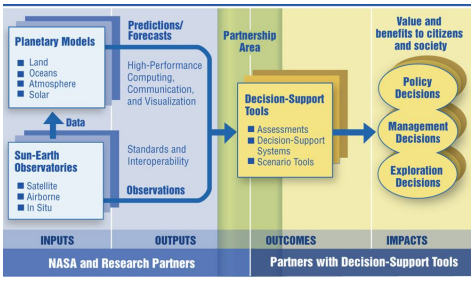
President's FY 2006 Budget Request

(Dollars in Millions)

Applied Sciences	FY2004	FY2005	FY2006	FY2007	FY2008	FY2009	FY2010
FY 2006 PRES BUD	30.3	43.5	52.2	51.5	50.8	48.9	54.3

Overview

The Applied Sciences program bridges the gap between scientific discoveries and practical applications that benefit society through partnerships that integrate the observations and predictions resulting from NASA Earth-Sun system science into solutions. Observations from NASA research spacecraft have proven to be valuable in improving forecasts of air quality conditions throughout the United States, assessing crop production estimates globally, and monitoring volcanic eruption activity to benefit aviation safety. Improved predictions and forecasts enabled by NASA science are systematically transitioned to serve national priority applications requiring environmental information on climate, weather, natural hazards, and sustainability. As we move forward into 2006, the NASA Applied Sciences program (DST) continues to benchmark contributions relevant to decision-support tools for policy, management, and exploration that are vital for the Nation's safety, security, and pioneering enterprises. This program supports Objective 14 and APG 6ESS20 and 6ESS21.



This diagram illustrates the assimilation of Earth-Sun system science observations and model products into decision support tools for policy, management and exploration.

For more information, please see http://science.hq.nasa.gov/earth-sun/applications/index.html.

Plans For FY 2006

The Applied Sciences Program will extend the results of research and development to increase understanding of the Earth-Sun system, and to support decisions for the exploration of Earth, the Moon, Mars and beyond. NASA, together with our partners, employs a systematic approach to benchmark the benefits of assimilating NASA research and development results into decision-support tools for areas of national priority: aviation, agriculture efficiency, public health, homeland security, ecological forecasting; and air quality, carbon, coastal, disaster, energy, invasive species and water management. A set of program element plans describes the projects and organizations working on the delivery of prototypes and benchmarks of integrated system solutions to contribute to these national priorities, addressing NASA goals and objectives. NASA collaborates with NOAA and other Federal agencies to systematically transition Earth-Sun system research results for operational utilization. NASA provides Earth and solar system scientists with verification of the performance of commercial remote sensing data products for use in exploration, thereby optimizing the value to the government of private sector investments in space. In FY 2006, the Develop activity will be expanded to develop human capital to meet future needs of the aerospace community. NASA will also participate in national and international organizations to establish standards and interoperability protocols and processes in support of national e-government programs.

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Changes From FY 2005

- The Applied Sciences program was formerly the Earth Science Applications Theme.
- The Earth Science Applications Theme included Education and Outreach.
- The Applied Sciences program includes emphasis on extending the benefits of sun-solar system research as well as Earth system science research.

Program Management

Applied Sciences program responsibility is at NASA Headquarters, Office of the Earth-Sun Systems Division of the Science Mission Directorate.

Technical Description

The Applied Sciences Program is focused on working with Federal agencies and national organizations to optimize the use of technology and data associated with NASA's constellation of over 30 Earth-Sun system observing spacecraft. These spacecraft, which routinely make measurements using over 100 remote sensing research instruments, are used by a community of Earth-Sun scientists in laboratories, universities, and research institutions throughout the country, and around the world, to model the Earth-Sun system and improve predictions, projections, and forecasts.

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Implementation Schedule:

Project	Schedule by Fiscal Year							Purpose	Phase Dates		
	04	05	06	07	08	09	10			Beg	End
Agricultural Efficiency								Benchmark the assimilation of NASA observations (e.g., Jason, MODIS) and evaluate ESMF predictions into USDA CADRE DST.	Tech Form Dev Ops Res	Oct-05	Sep-06
Air Quality								Verify and validate Aura products and evaluate potential of NPP products to serve EPA and/or NOAA air quality DST (e.g., AIRNow, CMAQ, WRF).	Tech Form Dev Ops Res	Oct-05	Sep-06
Aviation								Benchmark ESMF predictions in FAA DSTs (e.g., oceanic weather). Evaluate the potential of NPP observations to serve the FAA National Airspace System DST.	Tech Form Dev Ops Res	Oct-05	Sep-06
Carbon Management								Benchmark the assimilation of NASA observations (e.g., Terra, Aqua) in CASA/CQUEST DST. Evaluate or verify potential of carbon sequestration forecasts into USDA DST.	Tech Form Dev Ops Res	Oct-05	Sep-06
Coastal Management								Benchmark Aqua observations and model ocean condition products into NOAA HAB forecast. Evaluate potential of NPP products to serve coastal DST (e.g., GNOME).	Tech Form Dev Ops Res		
Disaster Management								Evaluate, verify and validate the potential of NPP sensor data (e.g., AIRS, CRIS, VIRS) into NOAA AWIPS DST	Tech Form Dev Ops Res	Oct-05	Sep-06
Ecological Forecasting								Benchmark assimilation of NASA observations (e.g., Terra, Aqua) and evaluate capacity of NPP observations and ESMF predictions to serve CCAD SERVIR DST	Tech Form Dev Ops Res	Oct-05	Sep-06
Energy Management								Evaluate capacity to assimilate NASA observations(eg CERES, SOHO, NPP) & ESMF predictions to energy DST's(DOE/NEMS, EPRI). Benchmark assimilation of products in DST (RETScreen,HOMER,NSRDB).	Tech Form Dev Ops Res	Oct-05	Sep-06
Homeland Security								Benchmark the assimilation of 2 or more ESMF predicitions into DHS Interagency Modeling and Atmospheric Assessment Center (IMAAC)	Tech Form Dev Ops Res		
Invasive Species								Verify and validate the capacity of NASA observations & ESMF predictions to serve USGS DST's.	Tech Form Dev Ops Res	Oct-05	Sep-06
Public Health								Verify and validate the capacity of NASA Earth-Sun System research results to serve NIH DST.	Tech Form Dev Ops Res		
Water Management								Verify, validate, and benchmark the assimilation of NASA observations (e.g., MODIS) and Land Information System products into DoI Bureau of Reclamations Riverware/AWARDS DST.	Tech Form Dev Ops Res	Oct-05	Sep-06

Tech & Adv Concepts (Tech)
Formulation(Form)
Development (Dev)
Operations (Ops)
Research (Res)
Represents a period of no activity for the Project

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	04	05	06	07	08	09	10			Beg	End
Crosscutting Solutions								Research to Operations: Implement approach for transition of NASA Earth-Sun system research data products for use by NOAA.	Tech Form Dev Ops Res	Oct-05	Sep-06
Crosscutting Solutions (Continued)								IWGEO: Deliver at least 5 benchmark reports for integrated system solutions	Tech Form Dev Ops Res	Oct-05	Sep-06
Crosscutting Solutions (Continued)								CCSP: deliver synthesis and assessment report (5.1) on uses and limitations of climate change measuremets and forecasts for decision support.	Tech Form Dev Ops Res		
Crosscutting Solutions (Continued)								Demonstrate interoperability on the use of research measurements, models, and solution in an Earth-Sun System Gateway (ESG).	Tech Form Dev Ops Res		

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Strategy For Major Planned Acquisitions

- Not Applicable

Key Participants

- Committee on Environment and Natural Resources, Committee on Climate Change Science and Technology Integration, Interagency Working Group on Earth Observations and bilateral agreements with Federal agencies and national organizations: Benchmark integrated system solutions.
- NOAA and other Federal agencies: Systematically transition Earth-Sun system research results for operational utilization.
- Joint Agency Commercial Imagery Evaluation (JACIE): Provide Earth and solar system scientists for verification of performance of commercial remote sensing data products for exploration.